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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Geoffrey Burke Bauer et al.	
Appln. No.:	10/807,088	Examiner: Ronnie M. Mancho
Filed:	March 23, 2004	Art Unit: 3664 Technology Center: 3600
For:	BODY STATE ESTIMATION OF A VEHICLE	Confirmation No. 3841
Attorney Docket No:	10543-69	

BRIEF ON APPEAL

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P.O. Box 1450
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This Paper is a Brief in support of the appeal of the final rejection of claims 1-3, 5, 7, 9, and 11 in the Office Action mailed January 22, 2009, as noticed in the Notice of Appeal filed April 22, 2009.

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I. REAL PARTY IN INTEREST

The real party in interest is Continental Teves, Inc., as recorded in the Office on September 16, 2004 at Reel 015135, Frames 0813. The party's name was spelled correctly on the Assignment, but misspelled by the Office in the Notice of Recordation. Correction of the Notice of Recordation has been requested of the Assignment Services Division in writing.

II. RELATED APPEALS AND INTERFERENCES

There are no other pending appeals, interferences or judicial proceedings related to the present appeal.

III. STATUS OF CLAIMS

Claims 1-3, 5, 7, 9, 11 and 18-30 are pending in this application. Of those claims, claims 18-30 have been withdrawn from consideration and are the subject of a co-pending Petition to the Director under 37 CFR § 1.144. Claims 1-3, 5, 7, 9, and 11 have been finally rejected and are the subject of this appeal.

IV. STATUS OF AMENDMENTS

Regarding the claims that are the subject of this appeal (claims 1-3, 5, 7, 9, and 11), no amendments have been filed by Appellant in this application after the January 22, 2009 mailing date of the final rejection. Claim 25 (withdrawn and not the subject of this appeal) was amended after the final rejection mailed on January 22, 2009, and the Examiner has not indicated whether the amendment will be entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention embodied in the rejected independent claims may be summarized as follows:

Independent claim 1 is the only independent claim being appealed at this time.

As recited in claim 1, the present invention is a system for estimating body states of a vehicle. Appl. para. 5, ll. 1-2; para. 11, ll. 1-2; Fig. 1 (element 10).

The system includes a first linear accelerometer and a second linear accelerometer mounted to the vehicle in separate locations from each other. Appl. para. 5, ll. 2-3; para. 7, ll. 3; para. 11, ll. 3-6; Fig. 1 (element 14); Fig. 2 (elements S_1 and S_2).

The first and second linear accelerometers are configured to measure the acceleration of the vehicle in a first direction and generate measured first and second linear acceleration signals based on the acceleration of the vehicle in the first direction, the measured first and second linear acceleration signals defining a first set of linear acceleration signals. Appl. para. 5, ll. 3-4.

The system also includes third and fourth linear accelerometers mounted to the vehicle in separate locations from each other. Para. 7, ll. 3; para. 11, ll. 3-6; Fig. 1 (element 14); para. 26, ll. 1-2, 4-6.

The third and fourth linear accelerometers are configured to measure the acceleration of the vehicle in a second direction that is different from the first direction and generate measured third and fourth linear acceleration signals based on the

acceleration of the vehicle in the second direction, the measured third and fourth linear acceleration signals defining a second set of linear acceleration signals. Appl. para. 5, ll. 3-4.

The system includes a signal adjuster configured to transform the first and second sets of linear acceleration signals from a sensor coordinate system to a body coordinate system associated with the vehicle. Appl. para. 5, ll. 4-6; para. 12, ll. 1-2; para. 13, ll. 1-2; Fig. 1 (element 18).

The system also includes an estimating filter configured to receive the transformed first and second sets of linear acceleration signals from the signal adjuster. Appl. para. 5, ll. 6-7; para. 12, ll. 2-5. The estimating filter is configured to process at least one of the transformed first and second sets of linear acceleration signals into at least one of a roll rate, a roll angle, and a yaw rate. Appl. para. 5, ll. 7-9; para. 13, ll. 3-7; para. 23, ll. 1-3.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Stated in the terms suggested by MPEP § 1205.02, the ground of rejection to be reviewed on appeal is:

> Whether Claims 1-3, 5, 7, 9, 11 are unpatentable under 35 USC § 103(a) over U.S. Patent Appl. Publ. No. 2005/0149240 to Tseng et al. (*Tseng*) in view of U.S. Patent No. 6,732,033 to LaPlante et al. (*LaPlante*)?

Subsidiary issues that may assist the Board in determining whether the claims are unpatentable over *Tseng* in view of *LaPlante* include the following:

> Whether either *Tseng* or *LaPlante* teaches a filter configured to process at least one set of linear acceleration signals, that it receives from linear accelerometers measuring acceleration in the same direction, into a roll rate, a roll angle, or a yaw rate?

VII. ARGUMENT

Claims 1-3, 5, 7, 9, 11 are Patentable Over the Combination Rejection Under 35 U.S.C. § 103(a)

In the January 22, 2009 Office Action, the Examiner finally rejected claims 1-3, 5, 7, 9, and 11 under § 103(a) as being unpatentable over *Tseng* in view of *LaPlante*. Appellant respectfully believes, however, that these claims are not rendered obvious by any combination of those references.

"[O]ne must determine whether the invention would have been obvious at the time the invention was made." MPEP § 2106(VI). If not, the claimed invention satisfies 35 U.S.C. § 103. *Id.* Therefore, "USPTO personnel should begin claim analysis by identifying and evaluating each claim limitation." MPEP § 2106(II)(C).

"[W]hen evaluating the scope of a claim, every limitation in the claim must be considered. USPTO personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered. MPEP § 2106(II)(C). "To support a *prima facie* conclusion of obviousness, the prior art must disclose or suggest all the limitations of the claimed invention." *Ex part Gleave*, 84 USPQ2d 1681, 1686 (Bd. Pat. App. & Inter. 2006) (citing *In re Lowry*, 32 F.3d 1579, 1582, 32 USPQ2d 1031, 1034 (Fed. Cir. 1994)); *see also Regent Jack Mfg. Co. v. United States*, 130 USPQ 235, 238 (U.S. Claims Ct. 1961) (claims were not obvious when the cited patents failed to disclose each and every element individually or in the combination specifically recited in the claims); *see also Ex parte Wikdahl*, 10 USPQ2d 1546, 1549 (Bd. Pat. App. & Inter. 1989) (The

references cited by the Examiner failed to meet all the limitations of the claim, therefore the rejection thereof under § 103 was reversed); *see also Ex parte Alexander*, 86 USPQ2d 1120, 1122 (Bd. Pat. App. & Inter. Nov. 30, 2007) (reversing the Examiner's rejections under § 103 because the Examiner did not identify all the elements of claim 1 nor provide a reason for combining the references). "[A]ll limitations must be considered and … it is error to ignore specific limitations distinguishing over the references." *In re BOE and DUKE*, 184 USPQ 38, 40 (CCPA 1974).

"All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970) (reversing the Board's obviousness determination because it ignored a term in the claims, and the ignored limitation was not found in the cited references). Moreover, the relationships between the elements must be considered in order to determine whether a claim would have been obvious in view of the prior art. *See, e.g.*, *Eastern Rotorcraft Corp. v. United States*, 154 USPQ 43, 45 (U.S. Claims Ct. 1967) (the recited spatial and functional relationships of the claim would not have been obvious because these relationships were nowhere suggested in the cited prior art); *see also Panduit Corp. v. Dennison Mfg. Co.*, 227 USPQ 337, 344 n. 18, 345 (Fed. Cir. 1985) (finding of obviousness was erroneous when the particular characteristics and relationships of the claimed elements were not found in the prior art); *see also In re Lowry*, 32 USPQ2d, at 1035 (the claimed invention was not

obvious over the cited reference because the cited reference did not disclose or suggest the claimed organization of information and its interrelationships)).

In this case, claim 1 is an independent claim from which claims 2, 3, 5, 7, 9, and 11 depend. As noted above in the summary of the claimed subject matter, claim 1 of the present application specifically recites a system for estimating body states of a vehicle, which includes a first set of linear accelerometers and a second set of linear accelerometers. The first set of linear accelerometers includes first and second linear accelerometers mounted to the vehicle in separate locations from each other, the first and second linear accelerometers being configured to measure the acceleration of the vehicle in a first direction. The second set of linear accelerometers includes third and fourth linear accelerometers mounted to the vehicle in separate locations from each other, the third and fourth linear accelerometers being configured to measure the acceleration of the vehicle in a second direction. The first direction is different from the second direction. The linear accelerometers generate measured acceleration signals. The system further includes a signal adjuster and an estimating filter. The estimating filter is configured to receive transformed first and second sets of linear acceleration signals from the signal adjuster and **process at least one of the first and second sets of linear acceleration signals into at least one of a roll rate, a roll angle, and a yaw rate**.

i. Both Tseng and LaPlante Fail to Teach a Filter Configured to Process a Set of Linear Acceleration Signals Into a Roll Rate, a Roll Angle, or a Yaw Rate

Tseng fails to teach, suggest, or disclose a filter configured to process a set of linear acceleration signals into at least one of a roll rate, a roll angle, and a yaw rate. To the contrary, *Tseng's* system uses a standard yaw rate stability control sensor set, which includes a lateral acceleration sensor, a yaw rate sensor, a steering angle sensor, and a wheel speed sensor, together with a roll rate sensor and a longitudinal accelerometer (p. 2, para. [0025]). These sensors make up a sensing system 16, which is coupled to a control system 18 (*Id.*). The system has several other elements, which ultimately result determining the pitch and roll angles of the vehicle (p. 4, para. [0044]).

The Examiner has stated on Page 4, lines 16-18 of the Final Office Action (mailed 01/22/2009) that *Tseng* teaches "the first and second linear accelerometers each being configured to measure the acceleration (sec 0025 to 0028, 0046, 0047) of the vehicle in a first direction…." *Tseng*, however, does not teach first and second linear accelerometers both being configured to measure acceleration *in a first direction*. To the contrary, *Tseng's* linear accelerometers each measure acceleration in different directions; in other words, *Tseng* does not teach a first linear acceleration and a second linear acceleration both configured to measure acceleration *in a first direction*.

In order to process linear acceleration signals alone into one of a roll rate, a roll angle, and a yaw rate, a filter or processor requires at least two signals measured in the same direction from accelerometers that are spaced apart from each other. Since only a single accelerometer in *Tseng* measures linear acceleration in a first direction,

it would be impossible for the filter to process the single linear acceleration signal in a given direction into one of a roll angle, a roll rate, or a yaw rate. Regardless, claim 1 requires that a set of linear acceleration signals in the same direction be processed into one of a roll angle, a roll rate, and a yaw rate. As one having ordinary skill in the art would understand, one cannot calculate a roll angle, a roll rate, or a yaw rate from a single linear acceleration signal in a given direction. *Tseng* determines at least one of a roll rate, a roll angle, and a yaw rate from angular rate sensors, which is typical in the art.

Appellants respectfully assert that *LaPlante* also lacks any teaching, suggestion, or disclosure of a filter configured to process a set of linear acceleration signals into at least one of a roll rate, a roll angle, and a yaw rate. Although *LaPlante* discloses first and second accelerometers 20, 22 configured to measure acceleration of the Sprung Mass (SM) and Unsprung Mass (USM) in a z-direction, there is no teaching of any filter that is configured to receive signals from the accelerometers of the SM and USM and process these signals into at least one of a roll rate, a roll angle, and a yaw rate.

In view of the foregoing, Appellants respectfully submit that even if *Tseng* and *LaPlante* were properly combinable, *Tseng* and *LaPlante* in combination fail to teach each and every element of the present invention, as set forth in claim 1. Again, more particularly, an element not taught, suggested, or disclosed in either *Tseng* or *LaPlante* is a filter configured to process a set of linear acceleration signals, the set

being two linear acceleration signals in the same direction, into at least one of a roll angle, a roll rate, and a yaw rate.

The Examiner has stated, on Page 9, lines 11-14, of the Final Office Action (mailed 01/22/2009), that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify *Tseng* as taught by *LaPlante* for the purpose of accurately measuring acceleration of vehicle in a given direction in case one of the accelerometers in the first or second direction gets bad, or as a back up when one accelerometer in a direction fails. The claimed invention of claims 1-3, 5, 7, 9, and 11, however, requires that both accelerometers be in use and in working order, because the claims require that the estimator process at least one of the sets of linear acceleration signals into at least one of a roll rate, a roll angle, and a yaw rate, the set including two measured acceleration signals in the same direction. There is no teaching in the cited art to use two linear acceleration signals in the same direction for processing into one of a roll rate, a roll angle, and a yaw rate.

ii. Summary: claims 1-3, 5, 7, 9, and 11 are patentable over the cited references

To show *prima facie* obviousness, the Examiner must show that each and every element of the invention is taught or suggested in the prior art. *See* MPEP § 2143.03. Since claim 1 requires a filter that is configured to process linear acceleration signals measured in the same direction, and to process such signals into at least one of a roll rate, a roll angle, and a yaw rate, and since the Examiner has cited no prior art showing or suggesting these elements, the Examiner has not made a

prima facie showing of obviousness. Clear error therefore exists in the Examiner's rejections because the Examiner has omitted one or more essential elements needed for a prima facie rejection. Therefore, Appellants respectfully request that the Board remove the rejections of record and allow Appellants' claim 1 and claims 2, 3, 5, 7, 9, and 11 depending therefrom.

VIII. CONCLUSION

For at least the above reasons, the Appellants submit that claims 1-3, 5, 7, 9, and 11 are patentably distinguishable over the art relied upon the examiner. As such, the Appellant respectfully further submits that the rejection of these claims under 35 U.S.C. § 103(a) should be reversed.

IX. FEES

Appellant has calculated a briefing fee of $540.00 to be due pursuant to 37 C.F.R. 41.20(b)(2) in connection with the filing of this Brief. This fee is enclosed. Appellant has authorized charging this fee, and any deficiency associated with the filing of this Brief, to Deposit Account No. 23-1925.

Respectfully submitted,

June 22, 2009	/Bonnie R. Shaw/
Date	Bonnie R. Shaw (Reg. No. 60,493)

Attachments: Claims Appendix
Evidence Appendix
Related Proceedings Appendix

X. CLAIMS APPENDIX

This claims appendix includes claims that are presently being appealed, and not claims that are withdrawn from consideration.

1. A system for estimating body states of a vehicle comprising:

a first linear accelerometer and a second linear accelerometer mounted to the vehicle in separate locations from each other, the first and second linear accelerometers being configured to measure the acceleration of the vehicle in a first direction and generate measured first and second linear acceleration signals based on the acceleration of the vehicle in the first direction, the measured first and second linear acceleration signals defining a first set of linear acceleration signals;

a third linear accelerometer and a fourth linear accelerometer mounted to the vehicle in separate locations from each other, the third and fourth linear accelerometers being configured to measure the acceleration of the vehicle in a second direction and generate measured third and fourth linear acceleration signals based on the acceleration of the vehicle in the second direction, wherein the second direction is different from the first direction, the measured third and fourth linear acceleration signals defining a second set of linear acceleration signals;

a signal adjuster configured to transform the first and second sets of linear acceleration signals from a sensor coordinate system to a body coordinate system associated with the vehicle; and

an estimating filter configured to receive the transformed first and second sets of linear acceleration signals from the signal adjuster and process at least one of the transformed first and second sets of linear acceleration signals into at least one of a roll rate, a roll angle and a yaw rate.

2. The system of claim 1 wherein the filter includes a model of the vehicle dynamics and a model of the linear accelerometers, the at least one of a roll rate, a roll angle and a yaw rate being based on the at least one of the transformed first and second sets of linear acceleration signals and the models of the vehicle dynamics and linear accelerometers.

3. The system of claim 2 wherein the filter includes an estimator, an algorithm being implemented in the estimator to process the at least one of the transformed first and second sets of linear acceleration signals and the models of the vehicle dynamics and linear accelerometers and generate the at least one of a roll rate, a roll angle and a yaw rate.

5. The system of claim 1 further comprising an angular rate sensor.

7. The system of claim 1 further comprising two linear accelerometers that measure accelerations in a third direction, wherein the third direction is different from the first and second directions.

9. The system of claim 1 further comprising two linear accelerometers that measure the vertical accelerations of the vehicle.

11. The system of claim 1 wherein the signal adjuster further provides compensation for gravity biases associated with the linear accelerometers.

XI. EVIDENCE APPENDIX

NONE

XII. RELATED PROCEEDINGS INDEX

NONE